Space Weather Forecast

Issued on Monday, 11 July 2022 at 01:04 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Daily Chance of a Moderate-class X-ray flares and R1/R2 Radio Blackouts. Chance of G1/Minor Storms mainly day 3 (13th).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Low, despite a slight rising trend in background level and some occasional Common class flares. The most recent was a C4 peaking at 10/1810 UTC and originating from a new region in the southeast quadrant. A filament lift-off was also observed around 10/1700 UTC, which resulted in a CME (Coronal Mass Ejection) visible off the southwest limb. The results of the analysis are not yet fully known but it is not considered to be Earth-directed.

There are seven sunspot regions on the visible disc in total, with the two largest and most complex both occupying the eastern solar hemisphere. The larger and historically more active of the two showed proliferation in its intermediate spots and some spreading.

Solar Wind / Geomagnetic Activity: The solar wind generally followed a slow regime and showed little change. The number of particles comprising the solar wind was mainly within usual background levels. The magnetic field associated with these particles rose from Weak to Moderate between 10/0800-1400 UTC, with similar fluctuations in the important north-south component. The net result of the above solar wind measures was a largely quiet geomagnetic activity, with one Unsettled period in the 06-09UTC period.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is low with a daily chance of moderate-class flares. A progressive slight increase is possible in the four days, with the sunspots that present the greatest risk of flares still in the eastern solar hemisphere (therefore far from departing over the western horizon), possibly bolstered by further arrivals over the northeastern horizon into the new working week UTC.

Solar Wind / Geomagnetic Activity: A glancing blow from a CME may affect Earth late today (11 July) but confidence is low. Another and more prominent CME may arrive at Earth at the end of day 2 (12th). Solar winds may become enhanced today, under the influence of the HSS from CH99/+, and stay elevated through much of the forecast period. Geomagnetic activity is expected to be largely Quiet to Unsettled with a chance of an Active interval on days 1 and 2 (11th and 12th) but to become increasingly Unsettled and Active at the end of day 2 and into day 3 (12th and 13th), with a significant Chance of G1/Minor Storms under the influence of the CME that left the sun late on 9 July.

Energetic Particles / Solar Radiation: Unless there is significant sunspot development, the

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high energy proton flux (greater than 10 MeV) is likely to remain at Background levels. There is however a daily Slight Chance of S1 or greater, due to the presence of two relatively large sunspot regions over the eastern hemisphere.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	20	50	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	50	50	50	50
Very Active	R3 to R5 X	No	15	15	15	15

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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